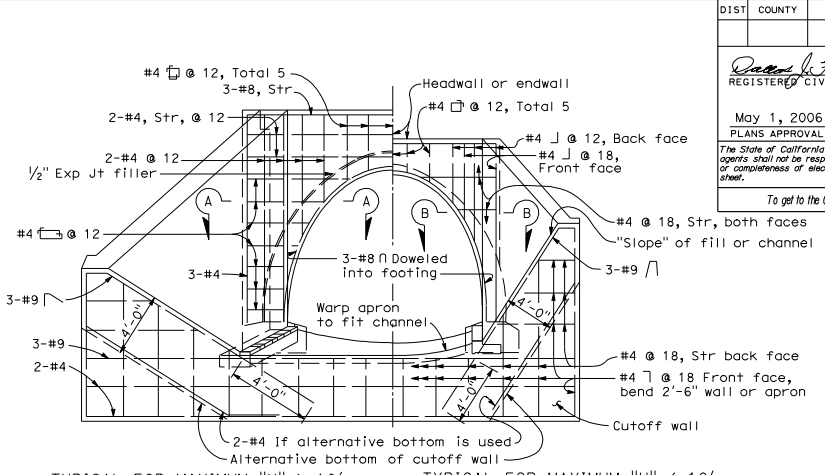
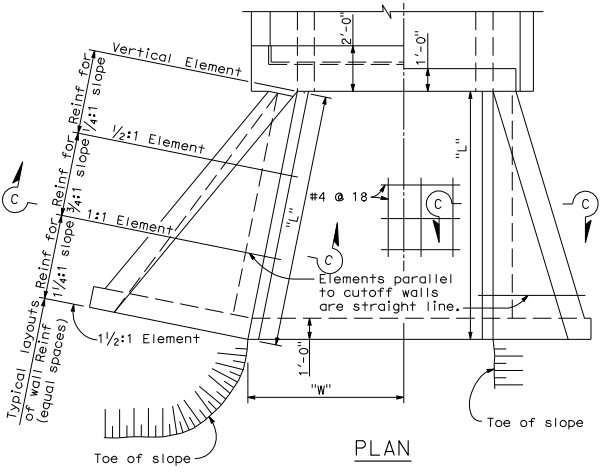


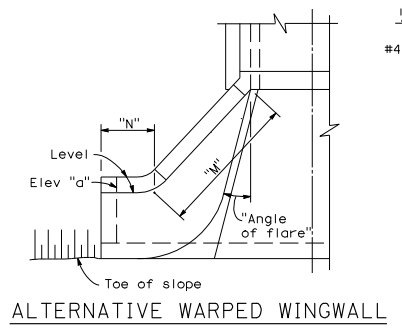
TYPICAL FOR MAXIMUM "H" > 10' TYPICAL FOR MAXIMUM "H" ≤ 10'  
PART LONGITUDINAL SECTION



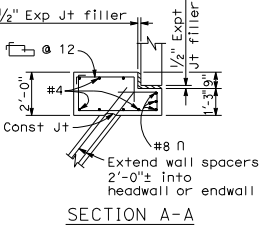
TYPICAL FOR MAXIMUM "H" > 10' TYPICAL FOR MAXIMUM "H" ≤ 10'  
END ELEVATION



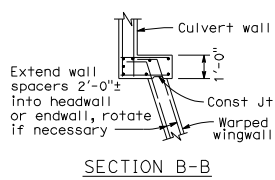
PLAN



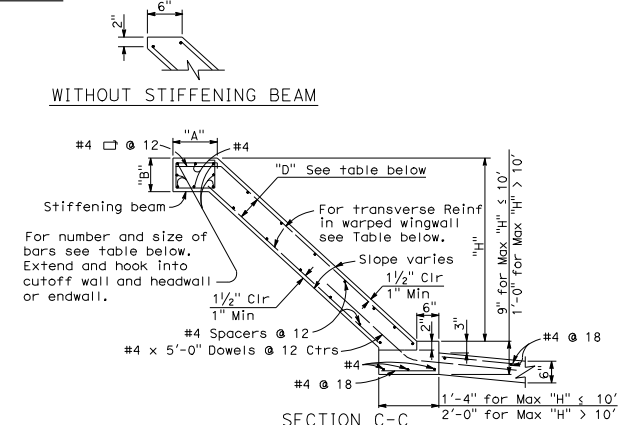
ALTERNATIVE WARPED WINGWALL  
Use where additional protection to toe of embankment is required.



SECTION A-A



SECTION B-B



SECTION C-C

WALL DIMENSIONS AND REINFORCING									
Element Slope	"H"	8' or less	10'	12'	14'	16'	18'	20'	
1/4:1	Front face Reinf	#4 @ 12	#4 @ 7	#5 @ 7	#5 @ 5	#6 @ 6	#7 @ 7	#7 @ 6	
	Rear face Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	
3/4:1	Front face Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 10	#4 @ 8	#4 @ 6	
	Rear face Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 10	#4 @ 7	#4 @ 6	#5 @ 8	
1 1/4:1	Front face Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	
	Rear face Reinf	#4 @ 8	#4 @ 8	#4 @ 5	#5 @ 6	#6 @ 7	#6 @ 6	#7 @ 6	
"D" at Cutoff Wall	6"	6"	6"	8"	9 1/2"	11"	11"	11"	
"D" at Culvert	6"	6"	6"	8"	9 1/2"	11"	11"	11"	

STIFFENING BEAM DIMENSIONS AND REINFORCING									
"L" Max	12'	14'	16'	18'	20'	25'	30'	35'	40' or more
6'	No beam. Place 2-#6 in each face along top of wall.								
8'	"A" = 1'-0"								
10'	"B" = 9"								
12'	"A" = 1'-6"								
14'	"B" = 1'-0"								
16'	"A" = 1'-10"								
18'	"B" = 1'-0"								
20'	"A" = 2'-0"								

NOTES:  
Walls designed for 2'-0" surcharge; earth load = 120 LB/CF; equivalent fluid pressure = 36 LB/CF.  
Vary "D" of warped wall uniformly from that at cutoff wall to that at headwall or endwall, for maximum "H" > 12'.  
Dimensions "L", "W", "H", "M", "N", "Elev "a", "Angle of flare", and "Slope" (as apply) are shown on the plans.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ARCH CULVERT  
HEADWALLS, ENDWALLS  
AND WARPED WINGWALLS**

NO SCALE

**D86C**

DIST COUNTY ROUTE POST MILES TOTAL PROJECT SHEET TOTAL NO. SHEETS

May 1, 2006  
PLANS APPROVAL DATE  
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.  
To get to the Caltrans web site, go to <http://www.dot.ca.gov>

REGISTERED CIVIL ENGINEER  
Dallas Forester  
No. C37165  
Exp. 12-31-06  
CIVIL  
STATE OF CALIFORNIA